

905-R-83-115

SAMPLE HANDLING PROTOCOL FOR HAZARDOUS WASTE
REM/FIT CONTRACT

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION V
ENVIRONMENTAL SERVICES DIVISION
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605

MAY 3, 1983

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: MAY 02 1983

905R83115

SUBJECT: Sample Handling Protocol for Hazardous Waste, REM/FIT Contract

FROM: William H. Sanders III, Director
Environmental Services Division

TO: Richard Bartelt, Chief and Michael Harris and Joseph Petrilli, FIT
Remedial Response Branch CH₂MHILL, Incorporated Ecology & Environment

Attached is a copy of the Region V Environmental Services Division "Sampling Handling Protocol for Hazardous Waste REM/FIT Contract". When it is known that samples will be shipped to a National Contract Laboratory for analysis, this protocol must be followed in total by all authorized samplers.

While this protocol is applicable for the analysis of water, oils and solid wastes, the same procedure must be used for air analysis requests. These requests will be processed under special analytical services (see page 2 of protocol).

For additional information, please contact Charles Elly, Sample Analyses Coordinator, at the Central Regional Laboratory at 353-8370.



William H. Sanders III

Attachment(s)

cc: Sanders
Yeates
Dikinas
Ross
Adams
Constantelos
Vanderlaan
Diefenbach
Getty, FIT

REM/FIT PROTOCOL

The following procedures shall apply with regard to data review and sample handling.

I. CASE SET-UP AND LOGISTICS OF SAMPLE HANDLING

A. CH₂MHILL will set-up its own cases to secure National Contract Laboratories (NCL's) by telephoning the EPA, Sampling Management Office (SMO) in Alexandria, Virginia (702-557-2490, Ms. Eileen O'Connor). For high hazard samples which require inorganic analysis, CH₂MHILL will have to first contact Ms. O'Connor, followed by a written request from the EPA Regional Counsel or the ESD Director (copy to SMO & Regional Lab) to Dr. Theodore Meiggs, Assistant Laboratory Director, EPA, National Enforcement Investigations Center (NEIC)(303-234-4661).

B. CH₂MHILL will provide Mr. Charles Elly, EPA, Region V, Environmental Services Division, Central Regional Laboratory (CRL) with copies of the case number, NCL and yellow copy of the chain-of-custody form for each study. This should occur not more than two (2) days after samples have been shipped to the NCL. If sampling will occur frequently, than reports should be submitted to Mr. Elly on a weekly basis.

C. Charles Elly or other CRL personnel will prepare all Special Analytical Services requests (SAS's), secure NCL's and case numbers for the SAS's and send the information to CH₂MHILL and to Paul Friedman of the SMO. Dr. Friedman will review all SAS data. Following are examples of when SAS's will be required.

1. Priority Pollutant Organic and Metals Analysis of Oils are requested.
2. EP Toxicity, Flashpoint and other RCRA Solid Waste parameters are requested.
3. Dioxins are requested by the Region VII or High Resolution Method.
4. Parameters other than the 114 Priority Pollutant Organics or the Task 1 and 2 Metals or Task 3 Inorganics are requested.
5. Lower detection limits than those in the regular IFB's are requested. Other quality control which is more extensive than the IFB calls for.
6. Quicker turnaround times than the normal 30 to 40 days are requested.
7. Other requests not covered above.

D. Packaging and Shipping

CH₂MHILL shall use as a guide the Region V "Sampling Handling Protocol for Hazardous Waste", May 27, 1982 and the "Users Guide to the EPA Contract Laboratory Program", August 1982 (Attached).

II. DATA REVIEW

One copy of the data initially will be sent by the National Contract Laboratory to the SMO (Paul Friedman) and one copy will be sent to the CRL.

A. Dr. Paul Friedman will review all of the data.

B. Ms. Marcia Kuehl, CRL Quality Control Coordinator will establish formal procedures for insuring that Dr. Friedman is reviewing data correctly. (This protocol will be formally tracked, since this is a pilot study).

C. Paul Friedman will forward his findings to the CRL. The CRL Data Coordinator will forward Dr. Friedman's findings (following verification) and all of the raw data to CH₂MILL.

III. TRAINING

Charles Elly and Kathy Getty or Cindy Bachunas of FIT will provide a one-day training session concerning implementation of the National Contract Laboratory Program.

IV. RESOLUTION OF PROBLEMS

All problems involving samples should be referred by SMO to CH₂MHILL, and all problems regarding data should be referred to Dr. Paul Friedman. All correspondence on these issues should be copied to Charles Elly and/or Marcia Kuehl.

Attachments

REGION V
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: JUN 0 3 1982

SUBJECT: Revised Sample Handling Protocol for Hazardous Waste

FROM: William H. Sanders III, Director
Environmental Services Division

TO: Gerald Regan, CDO
A.R. Winklhofer, EDO
Joseph Petrilli, FIT
Scott McCone, TAT

Attached is a newly revised copy of the Region V Environmental Services Division "Sample Handling Protocol for Hazardous Waste". When it is known that samples will be shipped to a National Contract Laboratory for analysis, this protocol must be followed in toto by all authorized samplers.

While this protocol is applicable for the analysis of water, oils and solid wastes, the same procedure must be used for air analysis requests. These requests will be processed under special analytical services (see Attachment #2 of protocol).

For additional information, please contact Charles Elly, Sample Analyses Coordinator, at the Central Regional Laboratory at 353-8370.

Attachment(s)

cc: Sanders
Yeates
Wagner
Ross
Adams
Constantelos
Bartelt
Vanderlaan
Diefenbach
Klepitsch
Kee
Schaffer
Sutfin
Bryson
Tebo

W. Sanders

**SAMPLE HANDLING PROTOCOL
FOR HAZARDOUS WASTE**

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION V
ENVIRONMENTAL SERVICES DIVISION
536 South Clark Street
Chicago, Illinois 60605**

May 27, 1982

SAMPLE HANDLING PROTOCOL FOR HAZARDOUS WASTE

I. OPERATIONAL PROCEDURES

A. Data Requests

For samples to be analyzed by the Central Regional Laboratory (CRL) or by a contract laboratory, all requests should be initiated by submittal of the ESD's Form-81-01 "Request for Analysis" (see Attachment #1). This form should be submitted, at least two weeks prior to the survey, to William H. Sanders III, Director, ESD, for Priority #1 surveys and to Curtis Ross, Director, CRL, for all other requests.

The following is a listing of priority types:

PRIORITY #1 - Highest priority work; immediate response or initiation of the project by CRL is necessary; or other work already in progress may be curtailed.

PRIORITY #2 - High priority projects to be scheduled and completed as soon as possible without disrupting other work already in progress.

PRIORITY #3 - Projects to be completed around Priority #1 and #2 projects, but with some definite completion date, usually, at least two or three months from request date.

PRIORITY #4 - Projects that may be completed if time is available. No requested due date.

Samples will be analyzed either at the CRL or by a National Contract Laboratory (NCL) administered by the VIAR & Company, Incorporated, EPA Hazardous Waste Investigations, Sample Management Office (SMO), hereafter referred to as "SMO". The decision of whether the samples will be analyzed at the CRL or by a contractor laboratory will depend

[Not A Requirement For State Personnel]

on the priority, parameter, and sample type, or other factors. Most Priority #1 samples will be analyzed at the CRL. (The Division Director and the CRL Director make the determination.)

With regard to samples sent to a National Contract Laboratory, Charles Elly is the EPA Region V SMO Coordinator. Elly will determine whether samples will be sent to a NCL or to the CRL to be analyzed. All prospective Samplers (FIT excluded - FIT and TAT have designated SMO Coordinators) must contact Elly. Elly also arranges for all analyses to be done under Special Analytical Services (SAS - see Attachment #2), as well as distribute SMO Traffic forms. Curtis Ross determines the disposition of "Toxics" or other types of samples.

Charles Elly resolves questions as to whether to analyze samples which were not collected according to the SMO protocol, inclusive of FIT collected samples.

When completing the ESD Sample Request form, as much information as possible should be provided about the site. This will help to assure the safety of laboratory personnel handling the samples and will assist in the proper selection of analytical methods.

Contractor Definitions

Generally, samples are divided into three categories: low, medium, or high hazard.

Low hazard samples are normally be groundwater, leachate, or surface water. (Concentration ranges from 0 to 10mg/l (10 ppm)) of constituents.

Medium hazard samples are up to 15% (150,000 ppm) of a single hazardous constituent. They are, for example, samples of materials lying along side of a drum. The lower range for medium hazard samples is 10mg/l (10 ppm).

[Not a Requirement For State Permit]

High hazard samples are samples of hazardous waste materials, generally, the contents of drums. (Concentration ranges from 15% to 100%.) These samples are usually sent to the National Enforcement Investigations Center, Regulated Substances Laboratory in Denver, Colorado, for dilution and extraction, and then sent to a NCL, the NEIC or the CRL for analysis. Following are the turnaround times which NCL's are required to provide:

- Low Hazard Samples: Waters; organic and inorganic analyses: 40 calendar days.
- Low and Medium Soil and Sediments: Organic and inorganic analyses: 30 calendar days.
- Medium Waters: 30 calendar days.
- High Concentration Samples: 21 calendar days at the NEIC and 30 calendar days at a NCL

(The total number of calendar days is equivalent to 51 calendar days.)

- SAS: No set limitations (see Attachment #1).

B. LOW HAZARD SAMPLES (Water, Soil, Sediment)

Bottles, Preservation, Holding Times, Forms, Quality Control, Custody and Shipping Procedures

Each low hazard sample collection by either FIT, TAT, or EPA personnel shall consist of the following:

1. ORGANICS: Water

- 1-one gallon glass bottle (teflon-lined caps) or 2-half gallon glass bottles; iced to 4°C. MAXIMUM HOLDING TIME: 2 days until extraction.
- 2-40ml glass Volatile Organic Analysis (VOA) vials (duplicates); iced to 4°C (teflon-lined caps). MAXIMUM HOLDING TIME: 7 days.

ORGANICS: Soils and/or Sediments

- 1-8 ounce glass wide-mouthed bottle (teflon-lined caps) iced to 4°C (filled no more than three-fourths full with sample).

2. INORGANICS: Water

- 1-one liter high density polyethylene bottle (metals, 3ml 1:1 HNO₃ preservative). * MAXIMUM HOLDING TIME: 6 months.
- 1-360ml high density polyethylene bottle (Mercury, 3ml 1:1 HNO₃ preservative). MAXIMUM HOLDING TIME: 14 days
- 1-360ml high density polyethylene bottle (Mercury, 2ml of HNO₃+K₂Cr₂O₇ preservative). MAXIMUM HOLDING TIME: 28 days.
- 1-500ml high density polyethylene bottle (NH₃+TOC, 2ml 1:1, H₂SO₄ preservative, 4°C). MAXIMUM HOLDING TIME: 28 days
- 1-500ml high density polyethylene bottle (pH+F⁻, General Chem., no preservative, 4°C). MAXIMUM HOLDING TIME: 48 hours.
- 1-one liter high density polyethylene bottle (CN⁻, 5ml 6N NaOH preservative, 4°C). MAXIMUM HOLDING TIME: 14 days.
- 1-one liter high density polyethylene bottle (S²⁻, 8ml, Zinc acetate preservative, 4°C). MAXIMUM HOLDING TIME: 7 days.
- 1-one quart glass wide-mouthed bottle (Oil/Grease, 10ml 1:1 H₂SO₄ preservative). MAXIMUM HOLDING TIME: 28 days.
- 1-one liter high density polyethylene bottle (Phenols, 10ml CuSO₄-H₃PO₄ preservative, iced to 4°C). MAXIMUM HOLDING TIME: 48 hours.

INORGANICS: Soils and/or Sediments

- 1-8 ounce plastic wide-mouthed bottle (iced to 4°C). (Filled no more than three-fourths full with sample).

*NOTE: The pH of the sample should be checked in the laboratory, upon receipt of sample. If the pH is over 2, more HNO₃ should be added to bring it to 2 or below.

All low hazard samples should be preserved before arrival at the CRL (or a NCL), according to procedures listed above, which are consistent with those on pages VI-4 thru VI-6 of the Draft NEIC Manual (entitled "Enforcement Considerations-for Evaluations of Uncontrolled Hazardous Waste Disposal by Contractor's" Manual, National Enforcement Investigations Center (NEIC), Denver, Colorado; April, 1980. The amounts of preservatives recommended are consistent with DOT regulations, therefore, the samples can be shipped via Air Freight.

Field Quality Control

For low hazard water samples, a reagent blank is required for each type or group of parameters (especially those which require preservation). In all cases, the bottles must be the same as the sample bottles and must be filled with distilled-deionized or carbon-free water and the preservative, if any. This "field" blank should be taken to the site where the real samples are collected and handled under the same conditions as the samples.

For low hazard water and soil/sediment samples, a "field" duplicate is required for every ten samples collected.

The requirements for a field blank(s) and duplicate(s) is an EPA national quality assurance mandate and is fully implemented in Region V. The purpose is to detect laboratory and/or field contamination and variation.

As a minimum, there should always be at least one field reagent blank and duplicate per survey. Ideally, one blank and duplicate per ten samples should be collected where practical. If only one or two samples are collected and are critical, the Sampler should use judgment regarding collection of the blank and duplicate.

Chain of Custody Procedures

EPA Region V and FIT/TAT personnel must use the Region V "Chain-of-Custody Record" (from the EPA's Office of Enforcement) and Custody Tags. All samples to be tracked by CRL personnel must contain CRL sample numbers.

Attached is a memo from Robert Laidlaw, NEIC (Attachment #3), to Thomas Yeates, Region V DPO, which excellently highlights the chain-of-custody and should be used as a reference. Please note the requirement of a separate custody record for samples shipped to different laboratories and a separate custody sheet for each sampling site. Do not

put more than one survey on the same custody sheet (example: Breitenstine, Hershberger and Lake County Landfill surveys were all put on the same custody sheet). Each site of a facility should be listed separately.

Low hazard samples may be brought into the CRL; however, samples may also be shipped from the field, providing the following protocol is strictly adhered to - all samples which will be sent to a NCL should be accompanied by:

1. The SMO Organics Traffic Report
2. The SMO Inorganics Traffic Report
3. ~~The CRL Laboratory Sample Number~~
4. The Region V ESD Chain-of-Custody Form(s)
5. The Region V ESD Custody Tag(s)
6. The Region V ESD Custody Seal
7. Stick-On Label removed from the Traffic Report
8. ~~The Region V ESD Basic Data Form (for samples to CRL only)~~

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Not
Required
of
State Personnel

*Required of TAT, Regional EPA and FIT personnel.

All samples (organic and inorganic) are to be shipped via Federal Express, Purolator, or Emery.

Not Required
of
State Personnel

Charles Elly (or his designated alternative) should be notified prior to shipment of the samples. Elly will contact the Sample Management Office (SMO) for EPA and/or TAT, obtain a case number, and the NCL to which the samples will be sent. Under no circumstances is the Sampler to call the SMO or the NCL. This protocol must be adhered to by EPA and TAT personnel. FIT personnel make its own shipping arrangements with the SMO.

Packaging and Shipping

Before shipment, the Sampler must provide the following: (FIT is exempted)

1. Check to make certain the stick-on label(s) from the Organic and/or Inorganic Traffic Report form(s) is sticking to the bottle(s), along

with the Custody Tag(s) and that the Custody Tag(s) coincide with the CRL Sample Number(s) written on the Traffic Report sheets.

2. Complete all of the information on the Organic and/or Inorganic Traffic Report(s). The top (SMO copy) and pink (Regional copy) of the Organic and/or Inorganic Traffic Report(s) should be sent to Charles Elly no later than two (2) work days after sampling.

NOTE: The Air-Freight Bill Number and Carrier Company has to be called in to Charles Elly the same day of shipment (before 4:00 PM, CDT). The Sampler will have to make a copy if he/she desires one; all other sheets must be enclosed with the samples.

3. Place the original Chain-of-Custody Form sheet(s) in a plastic, water-proof envelope and enclose it with the samples. Send the yellow copy of the Custody Sheet to Charles Elly. The Field Sampler keeps the pink copy. Also, send Charles Elly a partially completed CRL Priority sheet (ESD and TAT personnel only) with Items #2, #3, #6, #8, #9, and #10 completed. Indicate under the "Remarks" Section the assigned CRL Sample(s) Number and where the samples were sent.

The same protocol is to be followed for samples brought (self-delivered) to the CRL for shipment. The partially completed Priority sheet should be given to Charles Elly to fill in the appropriate CRL Data Set Number(s), Sample Number(s), Case Number(s), and the location of where the samples will be shipped.

C. MEDIUM CONCENTRATION SAMPLES (Water, Soil, Sediment)

Bottles, Preservation, Holding Times,
Forms, Custody and Shipping Procedures

The following requirements apply for:

ORGANICS

Soils

1-8 ounce wide-mouthed, round, clear glass jar with screw-neck finish and teflon-lined cap (KERR AC802 brand or equivalent; available from VWR Scientific - Catalog No.#1694-063); filled one-half to three-fourths full with the sample. No ice or preservative. MAXIMUM HOLDING TIME: Not established yet.

Water

4-3 2 ounce wide-mouth, round, clear glass jars with screw-neck finish and teflon-lined caps; filled nearly full with the sample. No ice or preservative. MAXIMUM HOLDING TIME: Not established

*Not Required
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INORGANICS* - Soils And Waters

1-8 ounce wide-mouthed, round, clear plastic or glass jar with screw-neck finish and teflon-lined cap; filled one-half to three-fourths with the sample. No ice or preservative. MAXIMUM HOLDING TIME: Not established yet.

*A separate sample must be collected for organic and inorganic, since the samples will be sent to two different laboratories.

Field Quality Control

For medium hazard water or liquid samples, a reagent blank is recommended for each type or group of parameters, for example, one blank for organics, one blank for sulfides, etc. The bottle should be the same type as the sample bottles and must be filled one-half to three-fourths full with distilled-deionized or carbon-free water. This "field" blank should be taken to the site where the real samples are collected and handled under the same conditions as the samples.

For medium water and soil/sediment samples, a "field" duplicate is required for every ten samples collected.

The requirement for a field blank(s) and duplicate(s) is an EPA quality assurance mandate and is fully implemented in Region V. The purpose is to detect laboratory and/or field contamination and variation.

As a minimum, there should always be at least one field reagent blank and duplicate per survey. Ideally, one blank and duplicate per ten samples should be collected where practical. If only one or two samples are collected, the Sampler should use judgment regarding collection of the blank and duplicate.

Chain-of-Custody Procedures

The same procedures as outlined for low hazard samples (see page "5" of this protocol) should be used.

Shipping

All medium samples (organics and inorganics) are to be shipped via Federal Express, Purolator, or Emery Air Freight.

Guidelines for shipment of medium concentration hazardous waste samples are contained in the Draft NEIC Manual, 1980. Sampling should be carried out so as to collect only one phase per sample, if possible.

Medium hazard concentration samples must be shipped in cans via Federal Express, Purolator, or Emery. *recent*
Note the requirement for shipment of 32 ounce bottles in 1 GALLON cans.

Samples should be packaged as described in the NEIC Manual, and shipped according to DOT regulations. Each sample is packaged in an outer metal can with clips, tape or other positive seal. Each can is marked with the destination name and address; indicate "Flammable Liquid, N.O.S." (if not liquid, "Flammable Solid", N.O.S.) and "Cargo Aircraft Only" on the outside.

Inside the can, the sample is sealed inside a plastic bag. Vermiculite is used to cushion the sample inside the can. Traffic or laboratory numbers should be written on the inside sample tag and outside of the cans. Hazardous labels should also be placed on the inside and outside of cans.

If Federal Express is the carrier, the form "Federal Express Shipping Certificate for Hazardous Materials" (FEC-S-0147) must accompany the shipment. Other carriers have an equivalent form.

The same SMO Traffic forms are required, as for low hazard samples. However, on the Organic and Inorganic Traffic Reports it must be noted that the samples are "medium hazard concentration water, soil, or sediment".

Charles Elly (or his designated alternative) should be notified prior to shipment of the samples. Elly will contact the SMO for EPA

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For State
Personnel*

and/or FIT, obtain a case number, and the NCL to which the samples will be sent. Under no circumstances is the Sampler to call the SMO or the NCL. This protocol must be followed for EPA and TAT personnel. FIT personnel makes its own arrangements for shipment with the SMO.

D. HIGH HAZARD SAMPLES (Organic/Inorganic Liquid or Other Phases Collectable From Drums or Around Drums)

All high hazard samples should be collected according to the Draft NEIC Manual.

Bottles, Preservation, Holding Times, Forms, Custody and Shipping Procedures

ORGANICS AND INORGANICS (All fractions; liquids and solids)

1-8 ounce wide-mouthed, round, clear glass jar with screw-neck finish and teflon-lined cap (KERR AC802 brand or equivalent; available from VWR Scientific - Catalog No.#1694-063); filled one-half to three-fourths full with the sample. No ice or preservative.
MAXIMUM HOLDING TIME: Not established yet.

Table I contains an itemization of the sample sizes which are required to analyze each fraction.

Field Quality Control

A blank is not required. Duplicate sample(s) should be collected, wherever possible.

Chain of Custody Procedures

The same procedures as outlined for low and medium hazard samples (see page "5" of this protocol) should be used.

REQUIRED FORMS:

1. The SMO High Hazard Traffic Report (not required if analyses will be done at the CRL).

TABLE 1

SAMPLE CONTAINER AND QUANTITY REQUIREMENTS

Requests	Recommended Quantity Required	Shipping Container ^a
<u>ROUTINE REQUESTS:</u>		
Total Metals, Strong, and Weak Acid Anions	60 grams	8 ounce or smaller jar ^a with Teflon-lined cap
Total Mercury	3 grams	8 ounce or smaller jar ^a with Teflon-lined cap
Base/Neutral, Acid, and TCDD	6 grams	8 ounce or smaller jar ^a with Teflon-lined cap
Pesticides/PCB	6 grams	8 ounce or smaller jar ^a with Teflon-lined cap
Volatile Organics	6 grams	8 ounce or smaller jar ^a with Teflon-lined cap
<u>SPECIAL REQUESTS:</u>		
EP Toxicity	300 grams	1 quart glass jar with Teflon-lined cap
Corrosivity	1 liter	1/2 gallon glass jar with Teflon-lined cap
Ignitability	1 liter	1/2 gallon glass jar

^a Obtainable from VWR Scientific; Catalog No. #16194-063.

2. The NEIC Hazardous Waste Sample Preparation Request
3. The CRL Sample Number
4. The Region V ESD Chain-of-Custody Form(s)
5. The Region V ESD Custody Tag(s)
6. The Region V ESD Custody Seal
7. The Region V ESD Basic Data Form (for samples analyzed at the CRL only)

Packaging and Shipping

The requirements are the same as outlined for medium hazard samples. (Please read carefully and follow guidelines as outlined on pages 9, 10, and 11.)

Shipment of high hazard samples directly from the field is encouraged. The samples are mailed to the EPA, NEIC-Regulated Substances Laboratory, c/o Dr. Steven Kunen, Fred C. Hart Associates, (an EPA Contractor), Denver Federal Center, Building 53, Box 25227, Denver, Colorado, 80225.

*Not
needed*

~~One extra high hazard form must accompany all samples. This is for an NEIC prepared reagent blank. Spike, matrix spike and duplicate results will be added to the Sample Traffic form.~~

The Air-Freight Bill Number and shipping company must be phoned in to Charles Elly the same day, or early the next morning (as soon as possible). (FIT exempted.)

*Not Required
of State Personnel*

Charles Elly will contact Fred C. Hart Associates approximately two (2) weeks in advance of each projected on-site sampling survey to verify whether Hart Associates will accept the samples. The EPA, FIT or TAT Sampler must contact Charles Elly before shipment to Denver.

Copies of all the aforementioned items must be forwarded to Charles Elly immediately after shipment (24 hours or less). (FIT exempted.)

The turnaround time quoted by EPA, NEIC and Hart Associates is twenty-one (21) days for routine samples. (NOTE: This is only for extraction.) Further organic and inorganic analyses will be done at the CRL or a NCL, which will require additional turnaround time (probably 30 more days).

For samples which go directly from the NEIC (or Hart Associates) to a NCL, the Sampler forwards the SMO High Hazard form mentioned above. The NCL will forward the final sample analyses results to the Region V CRL.

E. Tracking of Samples

Tracking of EPA and TAT forwarded samples is done by Charles Elly. This is accomplished through the use of the attached Table (2) entitled "Status of Region V Hazardous Waste Samples". This Table is kept in a logbook and includes information beginning from the time of collection of the samples through the date of final analysis. The CRL Data Management Coordinator tracks data at the CRL after a copy of the Traffic Form(s) and Custody Sheet is given to William Sargent, CRL's Shipping and Receiving Clerk, who logs in the sample numbers and assigns a data set number (for EPA and TAT samples).

F. FIT Tracking of Samples

The FIT Contractor tracks its own samples. This was delegated from ESD to FIT to lessen the paperwork and burden on Region V EPA personnel, as well as to speed up data turnaround.

As a minimum, FIT transmits weekly (each and every Tuesday), to Charles Elly, the following:

Sample collection date; sample shipment date; sample type (low hazard soils, medium hazard concentration waters, etc.); National Laboratory samples were shipped to (and/or NEIC); NEIC Traffic numbers (inclusive of the total number of samples); SMO Case Number, CRL Numbers, and projected date of return.

Table 2: Status of Region V Hazardous Waste Samples

[illegible]

COLUMN TITLES:

1. Sample Site;
2. D.U.;
3. Sample time;
4. Collection date;
5. Shipment date;
6. VIAR (organic);
7. VIAR (inorganic);
8. NEIC (organic);
9. NEIC (inorganic);
10. CRL Sample number;
11. CRL Data Set number;
12. NEIC numbers;
13. VIAR (organic) Traffic number;
14. VIAR (inorganic) Traffic number;
15. Date extracts are sent to VIAR;
16. VIAR (organic);
17. VIAR (inorganic);
18. Extraction analyses completion date;
19. Date data received by: Data Management, Shipping&Receiving, Analyst;
20. Turnaround time;
21. Date data transmitted (in/out) to Requestor.

G. DATA SUBMITTAL AND RESPONSIBILITIES (FIGURE 1)

The NCLP data are sent directly to the CRL. A date of receipt is stamped on the data and it is given to the Data Coordinator. The Data Coordinator logs the data onto the Internal Tracking Sheet (Form 3) which includes the SMO Case and Traffic numbers, CRL Number(s), Decision Unit, Site Name and CRL Data Set Number; date information is assigned; listing of outstanding data not received; and the date the data is sent to the user. The Data Coordinator also completes and attaches a form entitled "Review of Region V Contractor Data" (see Attachment #4). Elly passes the organic data on to Kendall Young, CRL Organic Section Chief, who assigns a organic reviewer to the data. Inorganic data is passed from Charles Elly to either Dr. John Morris, CRL Metals Team Leader or Ms. Andrea Jirka, CRL Minerals/Nutrients Team Leader for review. Charles Elly may also review inorganic data, if the Team Leaders are scheduled for other duties.

Once the data have been reviewed by Organic and/or Inorganic Laboratory Section reviewers, it is returned to Charles Elly. If quality control (QC) deficiencies or out-of-control audits were noted by the reviewer(s), the data is passed to Ms. Marcia Kuehl, CRL Acting Quality Control Coordinator. Ms. Kuehl tallies these QC deficiencies and makes a recommendation as to whether the data should be released to the data user. Recurring QC violations and deficiencies with laboratories are documented and Dr. Eugene Meier, EMSL-Las Vegas, is notified through Dr. Alfred Haeberer. If the data are considered unacceptable for use, Elly is notified and the data are returned to him to arrange either additional sampling or re-analysis.

Data that has passed through review by the Organic and/or Inorganic Laboratory Section reviewers with no QC deficiencies or out-of-control audits noted, are directly returned to Charles Elly for final review. The Data Management Coordinator is responsible for actual data transmittal to the data user. A xerox copy of the data is made and attached with a cover memo (Attachment #4) which notes QC violations, if any, that affect the data.

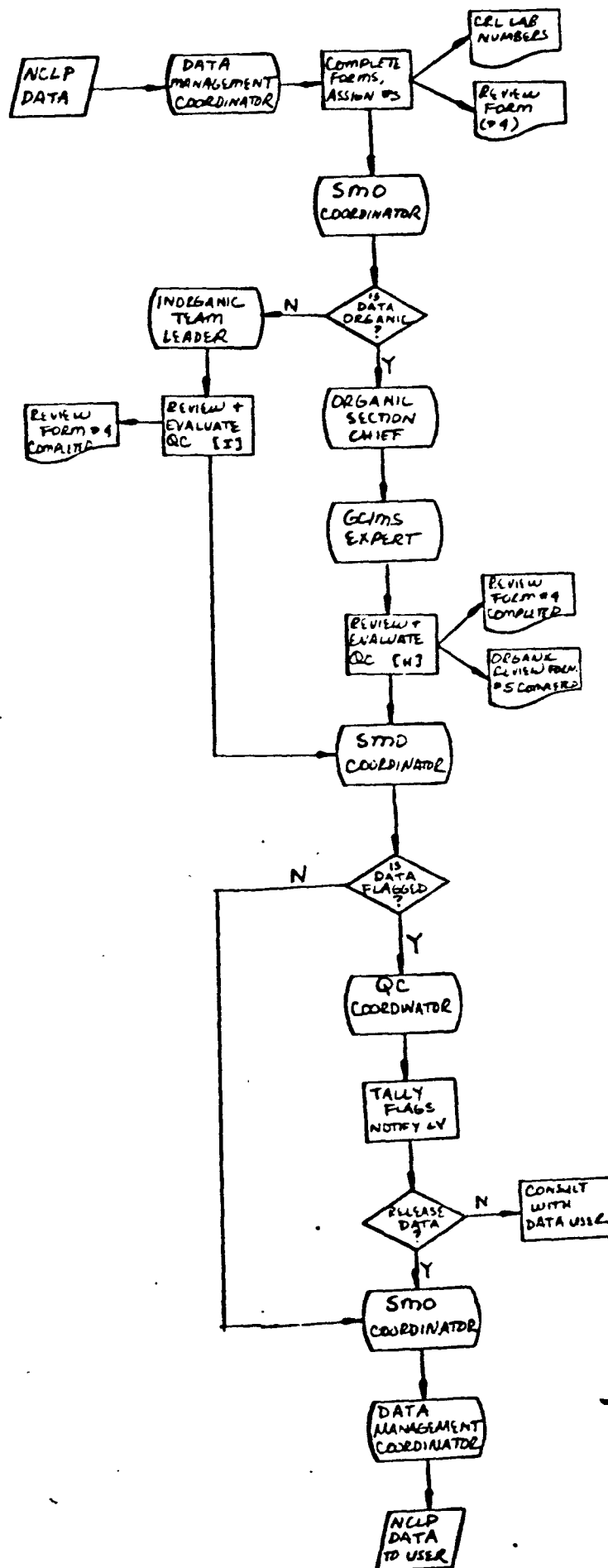
QC flags are noted on Attachments #4 and #5 (for organic data only). Attachment #5 is a draft of the "Regional Review of Uncontrolled Hazardous Waste Site Contract Laboratory Data Package" and has been revised to suit Regional needs. This review form is to be sent to the SMO when QC problems requiring total rejection or organic data occur and is routinely sent to the data user.

The following two Sections explain the criteria and specific acceptance limits used by the CRL data reviewers.

H. REVIEW OF INORGANIC CLP DATA

The following items are checked, by the Inorganic reviewers, and deficiencies and/or out-of-control audits are entered on Attachment #4. Form #6 must be completed for all SAS case data and sent to SMO only.

FIGURE 1. FLOW OF NCLP DATA AND REVIEW



1. DATA SHEETS should be legible, in sequential units and the minimum detection limits should be listed with the instrument noted.

ACTION: Call SMO

2. FINAL DATA PACKAGE should contain:

ALL Tasks: Results for each sample to two significant figures
List of detection limits used, supporting raw data

TASK 1: ICAP or validated alternate results for Al, Cr, Ba, Be, Cd, Co, Cu, Fe, Pb, Ni, Mn, Zn, B, V, Ca, Mg, Na
*Inorganic Quality Assurance form

TASK 2: Flame/furnace AA results for As, Sb, Se, Tl, Hg, Sn, Ag
*Inorganic Quality Assurance form

TASK 3: a) Low concentration NH₃, F, S, CN, pH and TOC results
b) Medium concentration NH₃, S, and CN results
Inorganic Quality Assurance form

*Inorganic Quality Assurance forms contain initial calibration verification, continuing calibration verification, duplicate and spike results.

3. METHOD BLANKS should contain less than one-half the minimum detection limit and should be reported on the data sheets with the results.

ACTION: Flag affected samples as contaminated

4. INITIAL and CONTINUING CALIBRATION VERIFICATION should be reported on the Inorganics Quality Assurance forms. Continuing calibration verification should show no drift larger than that listed on form 1. If this drift did occur, a new initial calibration curve must be included.

ACTION: Flag affected samples as having unreliable quantitation

5. ICAP INTERFERENCE CHECKS should be run at the beginning, end, and once every 20 samples. Results should be recorded and labeled as "ICAP Interference Check" on the Inorganics Quality Assurance form, under Section II.

ACTION: Flag affected sample data as possible biased

6. LAB DUPLICATES should be recorded on the Inorganics Quality Assurance form and not exceed the following limits for concentrations greater than the detection limit:

- 1) TASK 1: RPD <20
- 2) TASK 2: RPD <50
- 3) TASK 3: RPD <50

7. MATRIX EFFECT SPIKES should be recorded on the Inorganic Quality Assurance form and not exceed the limits listed in form 1.

ACTION: Flag the affected sample element(s) data as biased

8. FIELD QC

Field prepared duplicates should not vary by more than + 20%. Field blanks should be examined for contamination levels $> 1/2$ the detection limit.

CORRECTIVE ACTION: Flag all samples in case as being of $>20\%$ precision and/or containing bottle/sampler introduced contamination (if field blank contents vary from lab method blank contents, call field team to check on possible sources of contamination or imprecision).

. REVIEW OF ORGANIC CLP DATA

At a minimum, data reviewers must review the following eight items in judging organic data. Additional review items are listed to be pursued only when time and suspect data quality dictates it. Forms #4 and #5 must be completed for all routine and SAS CLP cases. Form #6 is for SAS data and is sent to SMO only. Form #2 gives the current criteria.

A) MINIMUM REVIEW ITEMS: (Not in order of importance)

1. BFB/DFTPP Specs must meet those in contract.

ACTION: Flag affected samples data- if the out-of-control mass not meeting specs. was used to ID or quantify a pollutant, it is invalid.

2. BLANKS must be clean ($<$ method detection limit) and sample concentration must be $>10 \times$ blank to be considered valid.

ACTION: Flag affected sample data appearing at $<10 \times$ blank contamination level as due to lab and/or field contamination.

3. POSITIVE PRIORITY POLLUTANT hits must be verified by visually checking MS, sample and retention time match up against standard.

ACTION: Cross-out incorrect pollutant and flag as not detected.

4. TENTATIVE ID's must be visually checked against spectra supplied - "elegant" compounds should be verified to see if they could survive the GC/MS conditions or if they are artifacts of the operator's imagination.

ACTION: Cross-out unreasonable compound match and note as unknown

5. HOLDING TIMES should be checked, this is only to be done if sample is a natural water or sediment. Drum samples are excluded as the time is not crucial.

ACTION: Negative hits should be noted as possibly being biased low for samples with holding times exceeded, positive hits need to be qualified as not meeting holding times.

6. DUPLICATE PRECISION for both field and lab should be within the criteria.

ACTION: Flag only the affected samples/duplicate compound data as imprecise, give actual RPD. If a compound is not detected at all in one sample or duplicate, flag that compound as questionable if the concentration level is $<10 \times$ detection. If the concentration level is $>10 \times$ detection, flag the precision of that compound as erratic. Note any non-homogeneity of sample in qualifying statement.

7. SURROGATE SPIKE RECOVERIES should fall within the criteria. If any lab notation is made of lab accidents or reruns, flag data accordingly.

ACTION: Flags depend on the number and severity of deviations from the limits. Note that only fractions per sample are flagged unless a generalization over the whole case can be made. Guideline levels are given below.

<u>FRACTION</u>	<u>TOTAL NUMBER</u>	<u># ACCEPTABLE</u>	<u>SAMPLE FRACTION QUALIFIER</u>
VOA:	2	2	acceptable
d ₆ Toluene		1	related compound data invalid
d ₈ Benzene		0	unacceptable and/or biased matrix problem.
ACID/R/N:	4		
d ₅ -phenol(A)		4	acceptable
2-fluorophenol(A)		3	acceptable with qualification: note compound class with out-of-control recovery
d ₅ -nitrobenzene(B/N)		2	if both A or B/N, that class of compounds invalid biased
2-fluorobiphenyl(B/N)		1	if one A and one B/N-data qualified as suspect
		0	one class data invalid, other suspect
		0	both compound classes unacceptable or biased, matrix problem?
TCDD:	1		
1,2,3,4-TCDD		1	dioxin data valid
		0	dioxin data invalid, matrix problem?

8. MATRIX SPIKE RECOVERIES should fall within the advisory limits criteria. If any lab notation is made of lab accidents or reruns, flag data accordingly. The flags only apply to the sample chosen as the spike.

ACTION: Flags depend on the number and severity of deviations from the limits. Guideline levels are given below:

<u>FRACTION</u>	<u># COMPOUNDS</u>	<u># ACCEPTABLE</u>	<u>SAMPLE QUALIFIER</u>
<u>VDA:</u>	3	3	acceptable
Chlorobenzene		2	actual level of the specific compound outside limit may be biased (compound flag)
Toluene		1	flag compound(s)
Benzene		0	unacceptable biased matrix problem?
<u>B/N:</u>	7	7	acceptable
1,2,4-trichlorobenzene		6	acceptable, flag compound(s)
acenaphthene		5	acceptable, flag compound(s)
2,4-dinitrotoluene		4	B/N data biased and/or erratic, flag compounds
di-n-butylphthalate		3	B/N data biased and/or erratic, flag compounds
pyrene		2	matrix problem? unacceptable biased
N-nitroso-di-n-propylamine		1	matrix problem? unacceptable biased
1,4-dichlorobenzene		0	biased
<u>ACID:</u>	5	5	acceptable
pentachlorophenol		4	acceptable, flag compound
phenol		3	acceptable, flag compounds
2-chlorophenol		2	B/N or acid data biased and/or erratic, flag compounds
p-chloro-m-cresol		1	unacceptable, biased matrix problem?
4-nitrophenol		0	unacceptable biased, matrix problem?
<u>PESTICIDES:</u>	3		
heptachlor		3	acceptable
aldrin		2	acceptable, flag compound
deildrin		1	unacceptable biased matrix problem?
		0	unacceptable biased matrix problem?

Note that all of a case's positive sample results for matrix spike compounds may need to be qualified if the sample chosen as the spike is representative of the entire case.

B) ADDITIONAL REVIEW ITEMS:

1. New or additional surrogate and matrix spike compound recoveries.
2. Initial and continuing calibration.
3. Tailing factor, benzidine and pentachlorophenol response.
4. Internal standards response stability.
5. Choose one positive hit sample/case and walk through all calculations for A/B/N, pesticides, VOA's.
6. Chromatogram quality (GC/MS & GC/EC)
7. Blind QA audit results if applicable.

I. DATA USAGE RECOMMENDATIONS

Data that has received QC flags (that render it useless to the Data Requestor) is brought to the attention of Dr. Alfred Haeberer, EPA Support Services Branch and Dr. Eugene Meier, EMSL-Las Vegas. This invalid data may be remedied by reanalysis or resampling and subsequent analysis by another laboratory. Continuing problems with particular laboratories or analyses is also brought to the attention of these two support people.

Presently, the CRL reviewers use the same protocol to review all CLP data (Sections II & III) regardless of data user QC requirements. Thomas Yeates, Region V DPO, is in the process of accumulating input from data users as to the intended objective of the data. Some data does not require as stringent QC as others. Data from sites indicated as less critical, or data intended as only a screening process will continue to be reviewed under the same protocol. Violations of limits and deficiencies will still be indicated on Attachment #4, but data may still be judged acceptable even though limits have been exceeded or deficiencies found. The data user will have full knowledge of the quality of the data and may request follow-up analyses.

Once the decision has been made to invalidate sample data, no matter what objective it was to serve, Region V will insist that the samples be reanalyzed under the CLP. Unacceptable data will not be released to the data user. The data user will be consulted during the decision making process to determine the degree of QC needed to best serve the data objective.

Once the data has been judged acceptable or preliminary, the CRL Data Management Coordinator puts the CRL lab numbers on all data sheets and makes a copy. Within 24 hours after review, the copy of the data and Attachment #4 are sent to the TAT, FIT or EPA data requestor. FIT and TAT data are transmitted to Cindy Bachunas (Environment & Ecology) through the mailbox in Thomas Yeates' office. REM/FIT data will be initially reviewed by Paul Friedman, SMO and verified by Marcia Kuehl before release.

- 23 -

The entire review and transmittal of data should take no longer than five (5) work days, after receipt by the CRL. Questions regarding the status of data should be referred to Charles Elly, SMO Coordinator. Questions regarding the quality of the data should be referred to Ms. Marcia Kuehl, CRL QC Coordinator.

TABLE 1. CONTROL LIMITS FOR INORGANIC ANALYSES

FORM 1

Analysis Method	Inorganic Species	% of True Value (EPA Set)	
		Low Limit	High Limit
ICP Spectroscopy	Aluminum	85	115
	Barium	84	116
	Beryllium	87	113
	Boron	84	116
	Chromium	88	112
	Cobalt	78	122
	Copper	83	117
	Iron	88	112
	Manganese	90	110
	Nickel	89	111
	Silver	80	120
	Vanadium	90	110
	Zinc	75	125
Atomic Absorption Spectrometry	Arsenic	86	114
	Antimony	85	115
	Cadmium	80	120
	Lead	78	122
	Mercury	80	115
	Selenium	85	115
	Thallium	88	112
	Tin	75	125
Other Inorganic Analyses	Ammonia	80	120
	Cyanide	80	120
	Sulfide	85	115

TABLE 2. SPIKED SAMPLE RECOVERY LIMITS

Analysis Method	Inorganic Species	% of True Value (EPA Set)	
		Low Limit	High Limit
ICP Spectroscopy	Aluminum	80	120
	Barium	80	120
	Beryllium	80	120
	Boron	80	120
	Chromium	80	120
	Cobalt	80	120
	Copper	80	120
	Iron	80	120
	Manganese	80	120
	Nickel	80	120
	Silver	80	120
	Vanadium	80	120
	Zinc	80	120
Atomic Absorption Spectrometry	Arsenic	75	125
	Antimony	75	125
	Cadmium	75	125
	Lead	75	125
	Mercury	75	125
	Selenium	75	125
	Thallium	75	125
	Tin	75	125
Other Inorganic Analyses	Ammonia	80	120
	Cyanide	80	120
	Sulfide	80	120

TABLE 1 - SURROGATE QA LIMITS FOR LOW LEVEL MIXTURES

	Soils		Water	
	90% Confidence Limits		90% Confidence Limits	
Benzene d_4	81	80-112	67	67-121
Toluene d_6	112	82-120	98	84-114
Phenol d_5	42	20-104	22	23-90
2-Fluorophenol	80	20-116	24	23-113
Nitrobenzene d_5	81	20-113	82	42-121
2-Fluoronitrophenyl	70	20-123	43	20-124
1, 2, 3, 4 TCDD	21	20-120	26	24-104

SURROGATE ADVISORY LIMITS BASED ON SINGLE LABORATORY DATA

	Soils		Water	
	n	Limits*	n	Limits*
1, 2 Dichloroethane d_4	100	90-130	100	90-130
4-Bromofluorobenzene (BFB)	98	97-137	98	63-127
terphenyl d_{14}	80	24-126	86	34-118
2, 4, 6 tribromophenol	78	22-124	83	47-123
dibutylchloranate	81	41-121	91	67-114

* These limits are for advisory purposes only. They are not to be used to determine if a sample should be reanalysed. When sufficient multilab data is available, standard limits will be calculated.

QC SCREEN/QC LIMITS

REPLICATE PRECISION RPD (TENTATIVE, not based on matrix specific duplicate data).

All Matrices/Levels: VOA: $\pm 15\%$
 B/B: $\pm 90\%$
 Acid: $\pm 40\%$
 Post: $\pm 40\%$

MATRIX SPIKE & RECOVERY**

All Water/Levels:	VOA:	*1,1-Dichloroethylene	-51-153
		*Trichloroethylene	-74-128
		Chlorobenzene	-67-111
		Toluene	-24-132
		Benzene	-24-132
B/B:		1,2,4-Trichlorobenzene	-20-108
		acronaphthene	-37-113
		2,4-Dinitrotoluene	-43-113
		Di-n-butylphthalate	-13-113
		Pyrene	-23-137
		N-nitroso-di-n-propylamine	-34-114
		1,4-Dichlorobenzene	-33-103
Acids:		Pentachlorophenol	-19-123
		Phenol	-23-81
		2-Chlorophenol	-33-107
		2-chloro-o-cresol	-32-108
		4-Nitrophenol	-15-93
Pesticides:		*lindane	-87-107
		heptachlor	-43-123
		aldrin	-43-109
		dieldrin	-34-122
		cadrin	-89-101
		oxy-DEH	-82-102

*Form EPA-600/4-83-857
 (3 of limits)

Date Adopted: 12/16/82
 Revised: 1/12/83
 Revision Due: 6/83

**Note: Please note that the limits are no longer rounded off. Investigation by the Chairman after the meeting showed that rounding off the upper limit is improper as it shows the limits. These limits, therefore, replace those in Bob Pritchard's memo of 1/3/83.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: _____

SUBJECT: Review of Region V-CLP Data
Received for Review on _____FROM: Curtis Ross, Director
Central Regional Laboratory

TO: Data User:

We have reviewed the data for the following case(s).

SITE NAME: _____ SMO CASE NO. _____

EPA Data Set No. _____ No. of
Samples _____ DU/Activity No. _____

CRL No.'s _____

SMO Traffic No.'s _____

Contract Lab: _____ Hours required for review: _____

Following are our findings.

- ☐ Data are acceptable for use.
- ☐ Data are acceptable for use with qualifications noted above.
- ☐ Data are preliminary pending verification by contractor laboratory.
- ☐ Data are unacceptable.

cc: Dr. Alfred Haebeler, EPA Support Services
Dr. Gene Meier, EMSL-LV
Rob Pritchard, SMO

**REGIONAL REVIEW OF UNCONTROLLED HAZARDOUS WASTE SITE CONTRACT
LABORATORY DATA PACKAGE**

TO: U.S. Environmental Protection Agency
Sample Management Office (SMO)
P.O. Box 818
Alexandria, Virginia 22313

CASE NO. _____

The hardcopied (laboratory name) _____ data package received at
Region _____ has been reviewed and the quality assurance and performance data summarized.
The data reviewed included:

SMO Sample No.	Conc. & Matrix	SMO Sample No.	Conc. & Matrix	SMO Sample No.	Conc. & Matrix
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Contract No. _____ requires that specific analytical work be done and that associated reports be provided by the contractor to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- Data completeness
- Duplicate analysis results
- Spectra matching quality
- Blank analysis results
- Surrogate spike results
- DFIPP and BFB performance results
- Matrix spike results

The data review forms for each of the above review items are contained within the body of this memo.

Comments: _____

DELIVERABLES

CASE # _____ (check if present)

CONTRACTOR _____ CONTRACT # _____

SECTION TITLE	
I	<u>NARRATIVE</u> Contains: Case #, Contract #, summary of any QC, sample, shipment and analytical problems, documentation of any internal decision tree process used.
II	<u>QC SUMMARY</u> *A. Surrogate X recovery summary form. *B. Reagent blank summary form. *C. Matrix spike duplicate/recovery form *D. Instrument tune & performance summary form
III	<u>SAMPLE DATA PACKET</u> A. <u>Sample Data in increasing SMO # order:</u> 1) HSL results. 2) GC/MS tentative ID sheet, even if none found. 3) Raw data (VOA, A/B/N, Pest, Dioxin) i. Chromatogram(s) ii. Data System printout iii. HSL spectra with standard (dual display) iv. GC/MS library search spectra v. Quantitation/calculation of tentative ID concentration
IV	<u>STANDARDS PACKET</u> A. Cross-reference table (lab's internal). B. VOA standards chromatograms and data system printout. C. A/B/N standards chromatograms and data system printouts. D. Pesticide standards chromatograms and data system printouts. E. Dioxin standards chromatograms and data system printouts. *F. Internal standard verification data sheet. *G. FSCC initial calibration data. *H. Calibration check. I. Current list of lab detection limits.

*Designates new form.

SMO 8-202-683-0885

MISSING DELIVERABLES:

ATTACHMENT #1

REQUEST FOR ES DIVISION SERVICES

The attached form should be completed for all services requested of the ES Division. The project objective must be clearly stated and should be developed in concert with ES Division personnel to facilitate project implementation and successful completion. Multiple requests (i.e., visible emission evaluations, CEI's, CSI's, PAI's, etc.) should be made with one form wherever possible. It is important to identify the decision unit and specific activity to which the project can be charged.

Include supplementary information as appropriate, i.e., correspondence, permits, consent agreements, or other important documents not currently available to ESD, as well as any specific requests or limitations the ESD project leader should be aware of. The ESD project leader will formulate a work plan and schedule in conformance with the project objective and priority. The work plan will be reviewed with the requestor. It is not desirable or necessary for the requestor to develop detailed work plans.

The requestor should use the following priority system when requesting work:

Priority 1 - Highest priority work; immediate response or initiation of the project by ESD is necessary; other work in progress may be curtailed.

Priority 2 - High priority projects to be scheduled and completed as soon as possible without disrupting other work in progress.

Priority 3 - Projects to be completed around Priority 1 and 2 projects, but with some definite completion date, usually at least two or three months from request date.

Priority 4 - Projects that may be completed if time is available. No requested due date.

The ES Division will acknowledge the request by return mail. Priority 1 work requests should be submitted along with adequate justification to the ES Division Director from the requesting Division or Office Director/Deputy Director. Copies should be delivered to the Central Regional Laboratory and the appropriate field office at that time. Priority 2, 3, and 4 work requests should be directed to the appropriate ES District Office and signed by the requesting Section Chief or above.

Turnaround time on Priority 1 requests will generally be from five to ten working days after receipt of request. More complex chemical analysis, larger sample sets and number of priority 1 requests will of course increase turnaround time accordingly. Therefore, be selective and keep such requests to an absolute minimum.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (ESD-81-01)
REGION V

DATE:

SUBJECT: Request For:

FROM:

TO: Project Objective:

Decision Unit _____ Specific Activity _____ Priority _____
Desired Completion Date _____ Legal Authority _____
Principal Contact: _____ Phone _____

Date:

Subject: Acknowledgment of Receipt of Work Request

From:

To:

_____ will do the above work (as specified) (with modifications).

Target Com. Date: _____ ESD Project No. _____ Est. Cost _____

ESD Project Leader: _____ Phone _____

Comments:

ATTACHMENT #2

SPECIAL ANALYTICAL SERVICES

**MENU OF
CONTRACT LABORATORY ANALYTICAL PROGRAM
SPECIAL ANALYTICAL SERVICES PERFORMED***

1. Organics and Inorganics Analyses — Fast Data Turnaround
2. " " — Added Capacity
3. " " — Analyses for Particular or Specified Compounds
4. " " — Analyses at Low Detection Limits
5. Specific Task (Volatile Only, etc.) Analyses
6. Specific PCB Analyses
7. Inorganics "Wet Chemistry" Parameters Analyses
8. Tissue Sample Analyses
9. RCRA Analyses — Identify Characteristics of Hazardous Waste
10. Fused Silica Capillary Column Analyses
11. Dioxin Analyses (Total and 2,3,7,8-TCDD)
12. Extracts Analyses

*Other Special Analytical Services upon request.

SPECIAL ANALYTICAL SERVICES

A. Background

In addition to standardized types of analyses provided under the Contract Laboratory Program, the Sample Analysis Program has established a system to provide limited custom or Special Analytical Services (SAS) which are beyond the scope of the current laboratory contracts and/or available protocols but which are consistent with Program objectives. Upon a sampler's request and Program authorization, the Sample Management Office will arrange for analytical services including but not limited to quick turnaround analyses, verification analyses, identification and quantification of non-priority pollutant compounds, general waste characterizations, RCRA, Dioxin and other specific analyses. The Sample Management Office, in its continuing performance of sample scheduling, data integration functions, and data base preparations, procures these Special Analytical Services by subcontracting with laboratories currently in the Contract Laboratory Program to perform the required task.

B. SAS Initiation

Depending on the complexity of the Special Analytical Service request, special services can be initiated in fairly short periods of time; however, because the SAS program requires SMO to procure laboratories on a competitive basis, at least a weeks lead-time is recommended. In general, the institution of Special Analytical Services, because of protocol diversity and specific laboratory procurement procedures, demands greater advance planning and more lead-time than required for the standard laboratory analyses programs.

1. **Sampler/Source Initiation Procedures**

The Special Analytical Services program is initiated by the following procedures.

a. User Request to the Sample Management Office

(Charles Elly)
To initiate a SAS, an authorized representative contacts the Sample Management Office by telephone with a description of sampling and analysis requirements. "Authorized user" refers to an individual previously specified either directly or using procedures established by the Sample Analysis Program Manager. Information required by SMO to fulfill a SAS request includes:

- o Type of service (task)
- o Definition and number of "units" (includes sample, fraction, etc.)
- o Dates of sample collection, shipment and required data and receipt.
- o Exactly what type of report or data is required (includes what information, format, chain-of-custody, etc.)
- o Confirmation of analytical protocols required.
- o Sampling personnel/telephone number if known.
- o Site/sample point information.

The sampling coordinator should complete all pre-request requirements or in-house documentation which could include the completion of specific cooperative agreements, procurement documents, etc.

Additionally, a written request document should be forwarded to SMO after the initial verbal contact.

b. Program Authorization and Protocol Confirmation

As the SAS program is an extension of the Contract Laboratory Program, the EPA Program Manager must review and approve qualified SAS requests. If a SAS request is authorized which requires a non-program methodology, the Quality Control/Quality Assurance Officer (EMSL/LV) confirms the validity of the requested analytic protocol, amending it as necessary. If the request is denied, the Program Manager indicates the reasons for denial.

c. Pre-Sampling Procedures

If accepted, the Sample Management Office telephones the SAS requestor to coordinate the sampling, sample shipment and analysis requirements.

- (1) SMO and the sampling coordinator agree to sample label numbers and any site or specific coding information to place on tracking documents and sample bottles. SMO provides the name and address of the analytical laboratory after a subcontract is awarded.
- (2) SMO forwards tracking documents to the SAS user, or arranges to have them supplied by the EPA Regional contact.

- (3) The SAS sampling coordinator provides all sample and tracking documents/instructions, etc. to sampling team leader (communication with SMO if necessary). Sampling takes place.
- (4) Sampling team leader telephones SMO after sampling with appropriate shipment information which includes:
 - o Date and time of shipment.
 - o Any changes in the sample numbers, types, etc. as specified in the SAS.
 - o Numbers of containers, confirmation of sample ID numbers, special instructions.
 - o Air carrier and airbill number.

2. Sample Tracking

SMO will track the sample/sample fraction from the sampling site through the laboratory(ies) in accordance with established Program procedures. SMO will provide and monitor all sample tracking forms and related documentation.

3. Data Receipt

- a. The laboratory will forward all data and other relevant document copies to SMO. SMO validates the data for completeness, deliverables completion within contractually-specified time periods, and adherence to all terms of subcontract.
- b. The EPA Program Manager and Technical Officer are responsible for technical validation of the data results. The EPA QA/QC Officer is responsible for the validity and accuracy of the quality control data.

- c. While all validations (technical and administrative) are being completed, the relevant data is forwarded to all appropriate parties (source, EMSL if requested, etc.) SMO will keep a file copy for possible future recall.

ATTACHMENT #3

**ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT
NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
BUILDING 53, BOX 25227, DENVER FEDERAL CENTER
DENVER, COLORADO 80225**

TO : Tom Yeates
DPD, Region V

DATE February 10, 1982

FROM : Rob Laidlaw
Evidence Audit Unit, NEIC

SUBJECT: Chain-of-Custody

As per our earlier discussion, I am enclosing copies of sample tags and chain-of-custody records filled out as an example of a hazardous waste site investigation. Also enclosed are EPA sample control and chain-of-custody procedures (October 1980).

Some specific concerns regarding documentation of custody are:

1. All members of the sampling team for a particular investigation should be listed on the sample tags and custody records. This provides a consistent record of individuals participating.
2. All information recorded on a sample tag should be identical to the custody record (station No., station description, date, time, project name, etc). This also provides consistency of documentation.
3. Station location descriptions need to be designated and all personnel refer to them in the same manner. Elimination of estimating by different investigators is desirable. For example,

one person records on a tag, station 01...leachate 10 yds from SE corner of storage shed,

another person records on a custody record, station 01... leachate 100 feet from SE corner of storage shed.

Even though the sample was taken at one location, the records show a difference of 70 feet. This is a very common type of documentation problem.

4. All blanks on tags and custody records should be filled out to the extent possible. This assures that all necessary information is recorded.
5. The first name in the "Relinquished by" box on the custody records must be one of the names listed as a sampler on line 2 (see example). If not, there is a potential break in custody in the documentation.

6. Airline representatives or Federal Express agents do not need to sign the custody record. If a secured container is given to them and a secured container is opened by the lab custodian, then custody has been maintained.
7. Method of shipment from the field to the laboratory should be entered in the remarks box (see example).
8. Separate custody records must be prepared if samples are shipped to two or more labs (see example, one custody record for a contract lab and one for the NEIC regulated laboratory).
9. Field crews must retain a copy of all custody records. These should be matched with laboratory copies once the files are assembled.
10. Recordkeeping should be done at the time of the work. Mistakes occur if personnel try to reconstruct activities at the end of a day.

Once the investigation is complete and records are assembled, demonstration that custody has been maintained becomes a tracking function. Each group that has collected samples (EPA or contractor) has the responsibility to review the information in their possession to determine that:

1. All samples collected have been identified and listed on a custody record.
2. Custody can be traced from the time of collection until shipped.
3. The custody record shows where samples are shipped.
4. Field logbook entries are consistent with other documentation.
5. Analytical results are matched with field records to assure that lab sample collected had data reported.

If this review identifies custody problems, the investigator should go through the available records to see if custody can be reconstructed or explained. Any unresolved problems should be brought to the attention of the project manager and the case attorney.

Laboratory documentation must also be assembled and reviewed. Custody records and analytical results should be matched with those from the field to assure consistency and completeness. Laboratory records should demonstrate that:

1. Samples were received secured.
2. Contents agreed with the custody record.
3. Custodian signs for receiving on custody record.
4. Samples were stored in a secured area.
5. Bench records show names of analysts.

The situation you mentioned where many different groups participate in sampling and analyses over a long period of time becomes difficult to manage. However, if each group reviews and verifies integrity of information they are responsible for, then consistency and completeness can be achieved.

The review process and document tracking is time consuming but has often paid off in satisfying our enforcement needs for producing records and preparing cases. Records produced for litigation that have not been reviewed can cause unexpected difficulties, and once the legal process has begun, we may not have the luxury of time to prepare an effective case record.

If I can be of further assistance, please feel free to call me (FTS 234-4706).

Enclosures

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

NATIONAL ENFORCEMENT INVESTIGATIVE SERVICE
Building 53, Box 25227, Denver Federal Center
Denver, Colorado 80225

CHAIN OF CUSTODY RECORD

[illegible]

Project Code	Station No.	Month/Day/Year	Time	Designate.	
000	01	11/1/82	0930	Comp	Grab <input checked="" type="checkbox"/>
Tag No. N-0900	Station Location		Samplers (Signatures)		
	Leachate from S. berm		J. Adams R. Jones L. Smith		
Lab Sample No	ANALYSES				
	Preservative: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
	BOD				
	Anions				
	Solids (TSS/TPS/ISS)				
	COD, TOC, Nutrients				
	Phenolics				
	Mercury				
	Metals				
	Cyanide				
	Oil and Grease				
	Organics GC/MS				
Priority Pollutants Ext <input checked="" type="checkbox"/>					
Volatile Organics					
Pesticides					
Mutagenicity					
Bacteriology					
Remarks: Jce					

Project Code	Station No.	Month/Day/Year	Time	Designate.	
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	Oil and Grease				
	Organics GC/MS				
Priority Pollutants					
Volatile Organics					
Pesticides					
Mutagenicity					
Bacteriology					
Remarks: Jce					

Project Code	Station No	Month/Day/Year	Time	Designate	
000	03	1-1-82	1015	Comp	X
Tag No N-0900	Station Location		Samplers (Signatures)		
	Drum leakage into Pond		J. Adams R. Jones		
Lab Sample No	ANALYSES				
	BOD Anions				
	Solids (TS, TSS, TDS, VSS)				
	COD, TOC, Nutrients				
	Phenolics				
	Mercury				
	Metals				
	Cyanide				
	Oil and Grease				
	Organics GC/MS				
	Priority Pollutants				
	Volatile Organics				
Pesticides					
Mutagenicity					
Bacteriology					
Remarks: See					


Project Code	Station No	Month/Day/Year	Time	Designate	
000	03	1-1-82	1015	Comp	X
Tag No N-0900	Station Location		Samplers (Signatures)		
	Drum leakage into Pond		J. Adams R. Jones		
Lab Sample No	ANALYSES				
	BOD Anions				
	Solids (TS, TSS, TDS, VSS)				
	COD, TOC, Nutrients				
	Phenolics				
	Mercury				
	Metals				
	Cyanide				
	Oil and Grease				
	Organics GC/MS				
	Priority Pollutants				
	Volatile Organics				
Pesticides					
Mutagenicity					
Bacteriology					
Remarks: See					

Project Code	Station No	Month/Day/Year	Time	Designate	
000	03	1/1/82	1015	Comp	X
Tag No N-0900	Station Location		Samplers (Signatures)		
	Drum leakage into Pond		J. Adams R. Jones		
Lab Sample No	ANALYSES				
	BOD Anions				
	Solids (TS, TSS, TDS, VSS)				
	COD, TOC, Nutrients				
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	Mercury				
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	Cyanide				
	Oil and Grease				
	Organics GC/MS				
	Priority Pollutants				
	Volatile Organics				
Pesticides					
Mutagenicity					
Bacteriology					
Remarks: See					

Project Code 000	Station No 04	Month/Day/Year 1/1/82	Time 1310	Designate X
Tag No. N-0900	Lab Sample No.	Station Location Standing liquid 10' S of Bldg 80	Samplers (Signatures) J. Adams R. Jones L. Smith	
		Remarks: See	ANALYSES	
		BOD Ammonia		
		Solids (TS, TSS, TDS, etc.)		
		COD, TOC, Nutrients		
		Heavy Metals		
		Mercury		
		Chloride		
		Oil and Grease		
		Organics GC/MS		
		Priority Pollutants		
		Volatile Organics		
		Pesticides		
		Mutagenicity		
		Bacteriology		

Project Code 000	Station No 04	Month/Day/Year 1/1/82	Time 1310	Designate X
Tag No. N-0900	Lab Sample No.	Station Location Standing liquid 10' S of Bldg 80	Samplers (Signatures) J. Adams R. Jones L. Smith	
		Remarks: See	ANALYSES	
		BOD Ammonia		
		Solids (TS, TSS, TDS, etc.)		
		COD, TOC, Nutrients		
		Heavy Metals		
		Mercury		
		Chloride		
		Oil and Grease		
		Organics GC/MS		
		Priority Pollutants		
		Volatile Organics		
		Pesticides		
		Mutagenicity		
		Bacteriology		

Project Code 000	Station No 04	Month/Day/Year 1/1/82	Time 1310	Designate X
Tag No. N-0900	Lab Sample No.	Station Location Standing liquid 10' S of Bldg 80	Samplers (Signatures) J. Adams R. Jones L. Smith	
		Remarks: See	ANALYSES	
		BOD Ammonia		
		Solids (TS, TSS, TDS, etc.)		
		COD, TOC, Nutrients		
		Heavy Metals		
		Mercury		
		Chloride		
		Oil and Grease		
		Organics GC/MS		
		Priority Pollutants		
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		Bacteriology		



Project Code	Station No	Month/Day/Year	Time	Designate																												
000	06	1-1-82	1400	Comp	<input checked="" type="checkbox"/>																											
Tag No N-0900	Station Location Andersen Ditch 50' from S. Fence		Samplers (Signatures) J. Adams R. Jones L. Smith																													
	<div> <div> <div>Preservative: Yes <input type="checkbox"/> No <input type="checkbox"/></div> <div>ANALYSES</div> </div> <table border="1"> <tr><td>BOD</td><td>Anions</td></tr> <tr><td>Solids</td><td>ITSS/ITOS/ISSI</td></tr> <tr><td>COD, TOC, Nutrients</td><td></td></tr> <tr><td>Phenolics</td><td></td></tr> <tr><td>Mercury</td><td></td></tr> <tr><td>Metals</td><td></td></tr> <tr><td>Cyanide</td><td></td></tr> <tr><td>Oil and Grease</td><td></td></tr> <tr><td>Organics GC/MS</td><td></td></tr> <tr><td>Priority Pollutants</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Volatile Organics</td><td></td></tr> <tr><td>Pesticides</td><td></td></tr> <tr><td>Mutagenicity</td><td></td></tr> <tr><td>Bacteriology</td><td></td></tr> </table> </div>					BOD	Anions	Solids	ITSS/ITOS/ISSI	COD, TOC, Nutrients		Phenolics		Mercury		Metals		Cyanide		Oil and Grease		Organics GC/MS		Priority Pollutants	<input checked="" type="checkbox"/>	Volatile Organics		Pesticides		Mutagenicity		Bacteriology
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Project Code 000	Station No. 08	Month/Day/Year 1-1-82	Time 1445	Designate Comp <input checked="" type="checkbox"/> G																															
Tag No. N-0900	Station Location Drum EPA #6		Samplers (Signatures) J. Adams R. Jones L. Smith																																
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Tag No. N-0900	Station Location Drum EPA #5		Samplers (Signatures) J. Adams R. Jones L. Smith																																
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Remarks:	PCB																																		

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

cliniquished by: (Signature) _____
Date / Time _____

Inscribed by: _____
Date / Time _____

1-3-82 0930
C. J. Johnson
A. J. Hill NO 11148X

DELIVERY ORDER
Under Provisions of
EPA Contract No. 68-01-6568

Order No. 0558

Date of Order _____ Emergency Order: _____
(date & time order called in)

FROM:
(Requestor
name, address
& telephone)

(signature)

TO: Repository Project Manager - Analytical Services Center
Ecology & Environment, Inc. - P.O. Box D - Buffalo, NY 14225
Telephone: 716/631/0360

Please ship the following items for arrival by: _____

_____ Order is designated for shipment to a temporary field location (e.g., hotel, local carrier
office). Please ship order to arrive no earlier than: _____
(date)

				CONTRACTOR USE ONLY
Item No.	Description	No. of Items Per Case	No. of Cases Ordered	No. of Cases Shipped
1	1/2 gallon amber glass bottle	12	_____	_____
2	40-mL borosilicate glass vial	100	_____	_____
3	1-L high-density polyethylene bottle	76	_____	_____
4	500-mL polyethylene bottle	161	_____	_____
5	16-oz wide-mouth glass jar	48	_____	_____
6	8-oz wide-mouth glass jar	96	_____	_____

Ship To: _____
(Designee
street address) _____

Attention: _____

CONTRACTOR USE ONLY

The above materials have been shipped as requested.

Date Shipped: _____ Mode of Shipment: _____
Signature: _____ A/B, UPS BOL No: _____
Type of Order: Routine _____ Emergency _____ Partial _____ Complete _____

DISTRIBUTION: White - Repository Copy, Yellow - Repository Copy for Return to SMO,
Pink - SMO Copy, Gold - Requestor File Copy

6/83

CRL

CURRENT CLP SMO IFB ANALYSIS LABORATORIES

Organics - Multimedia

California Analytical Laboratories, Inc. (916) 381-5105
5895 Power Inn Road
Sacramento, CA 95824

Attn: Bonnie McNeil
(916) 381-5105

ALTERNATE: Julia Frey

Organics - High Hazard

California Analytical Laboratories, Inc. (916) 381-5105
5895 Power Inn Road
Sacramento, CA 95824

Attn: Bonnie McNeil

ALTERNATE: Julia Frey

West Coast Technical Service
17605 Fabrica Way, Suite D
Cerritos, CA 90701

(714) 523-9200

Attn: Linda Krokenberger

PRIMARY: Jack Northington

Inorganics - Multimedia

United States Testing Company, Inc. (201) 792-2400 ext 253
1415 Park Avenue
Hoboken, NJ 07030 (Hudson)

Attn: Al Tordini

ALTERNATE: Richard Posner (ext 320)

Rocky Mountain Analytical Laboratories, Inc. (303) 421-6611
5530 Marshall Street
Arvada, CO 80002

Attn: Tony Maiorana

PRIMARY: Mark Carter

Chemtech Consulting Group, Ltd.
360 West 11th Street
New York, NY 10014

(212) 255-2100

Attn: Dr. Alan Schoffman

ALTERNATE: Frank Brezynski

Versar, Inc.
6621 Electronic Drive
Springfield, VA 22151

(703) 750-3000

Attn: Janet Beckman

PRIMARY: Richard Ronan

Sverdrup Technology
606 W. M. Northern Blvd
P.O. Box 884
Tallahassee, TN 37388
615-455-6400

BATeLle Columbus Co.
505 King Avenue
Columbus, Ohio 43
Attn: Fred DeRo

Inorganics - Multimedia (cont'd)

University of Washington
College of Fisheries
108 Fisheries, WH-10
Seattle, WA 98195

(206) 543-4259

Attn: Dr. A. Nevissi

ALTERNATE: John Sung

California Analytical Laboratories, Inc.
5895 Power Inn Road
Sacramento, CA 95824

(916) 381-5105

Attn: Bonnie McNeil

ALTERNATE: Julia Frey

JTC Environmental Consultants, Inc.
7979 Old Georgetown Rd.
Bethesda, MD 20014

(301) 656-5850

Attn: Deb White

ALTERNATE: Jeanne Hankins

Organics - GC Screen

West Coast Technical Service
17605 Fabrica Way, Suite D
Cerritos, CA 90701

(714) 523-9200

Attn: Linda Krokenberger

PRIMARY: Jack Northington

Energy Resources Company, Inc.
185 Alewife Brook Pkwy.
Cambridge, MA 02138

(617) 661-3111

Attn: Dallas Wait

PRIMARY: Tyrone Smith

Mead Compu/Chem
P.O. Box 12652
3308 Chapel Hill/Nelson Hwy.
Research Triangle Park, NC 27709

(919) 549-8263 ext 224

Attn: Angie Frye

PRIMARY: Becky Siebert/ALTERNATE: Paul Mi

Laucks Testing Laboratories, Inc.
940 South Harney
King County
Seattle, WA 98108

(206) 767-5060

Attn: Mike Nelson

ALTERNATE: Barbara McNatt

California Analytical Laboratories, Inc.
5895 Power Inn Road
Sacramento, CA 95824

(916) 381-5105

Attn: Bonnie McNeil

ALTERNATE: Julia Frey

Spectrix
3911 Fondren
Suite 100

Houston, Texas 77063 - 521 . n.a.c

Organics - GC Screen (cont'd)

U.S. Testing Company, Inc.
1415 Park Avenue
Hoboken, NJ 07030 (Hudson)

(201) 792-2400 ext 253

Attn: Al Tordini

ALTERNATE: Richard Posner (ext 320)

Hazleton-Raltech
3301 Kinsman Blvd/P.O. Box 7545
Madison, WI 53704

(608) 241-4471

Attn: David Hills

ALTERNATE: Chris Alstetter/Emilio Sturino

EAL Corporation
2030 Wright Avenue
Richmond, CA 94804

Attn: George Caesar, Jr.

High Hazard Containment

Fred C. Hart Associates
Regulated Laboratory
Denver Federal Center
Building 53 (Green Trailer)
Denver, CO 80225

(312) 234-2683

Attn: Steve Kunen

Revised 1/3/83

Dioxins
Environmental Testing & Certification Corp (E)
284 Raritan Center Parkway
Edison, New Jersey 08837
Attn: Sweet Davis

Wright State
8-513-873 2202

608-241-447
Chris Alstetter

SECTION TITLE	
V	<u>RAW QC DATA PACKET</u>
	A. <u>DFTPP</u>
	<ul style="list-style-type: none"> *1) GC/MS performance standard form. 2) Bar graph spectrum. 3) M/Z listing.
	B. <u>BFB</u>
	<ul style="list-style-type: none"> *1) GC/MS performance standard form. 2) Bar graph spectrum. 3) M/Z listing.
	C. <u>Chromatography Check Data</u>
	<ul style="list-style-type: none"> 1) Benzidine EICP's. 2) Pentachlorophenol EICP's/calculations. 3) GC/EC column check.
	D. <u>Blank Data(in order VOA, A/B/N, Pesticide, Dioxin)</u>
	<ul style="list-style-type: none"> 1) Chromatograms. 2) Data system printout.
	E. <u>Matrix Spike Data(in order VOA, A/B/N, Pesticide)</u>
	<ul style="list-style-type: none"> 1) Chromatograms. 2) Data system printout.
	F. <u>Matrix Spike Duplicate Data(in order VOA, A/B/N, Pesticide)</u>
	<ul style="list-style-type: none"> 1) Chromatograms. 2) Data system printout.
VI	<u>SAMPLE PREPARATION PACKET</u>
	A. Sample control sheet (lab's internal).
	B. Screen data(in order VOA, A/B/N, pesticide)
	<ul style="list-style-type: none"> 1) GC/FID chromatograms. 2) GC screen data sheets.

*Designates new form.

SMO: 8-202-683-0885

MISSING DELIVERABLES:

WATER SURROGATE PERCENT RECOVERY SUMMARY

CONTRACT NO. _____
HIGH LEVEL _____
OTHER (Specify) _____

CONTRACTOR
MED. LEVEL

CASE NO. _____
LOW LEVEL _____
WATER _____
QC REPORT NO. _____

RT NO.	[-----][Pesticide][Dioxin]
	Semi-Volatile
	Volatile
	2,4,6-Dibutyl
	1234

[illegible]

QC values are outside of QC limits.

****Advisory Limits.**

Comments:

--- Side of NC limits

Access Limit Set 12/82

CASE NO. _____
LOW LEVEL _____
WATER _____
QC REPORT NO. _____

**CONTRACTOR
MED. LEVEL**

CONTRACT NO. _____
HIGH LEVEL _____
OTHER (Specify) _____

[illegible][illegible]

... are outside of QC limits.

****Advisory Limits.**

Comments:

out of ____; outside of QC limits

Date Limit Set 12/82
Revision Due 6/83

MATRIX SPIKE DUPLICATE/RECOVERY

CONTRACT NO. _____
HIGH LEVEL _____
OTHER (Specify) _____ ug/Kg
UNITS (Circle) _____ ug/l

CONTRACTOR _____
MED. LEVEL _____
SOIL/SED. _____

CASE NO. _____
LOW LEVEL _____
WATER _____
QC REPORT NO. _____

FRACTION	COMPOUND	CONC. SPIKE ADDED	CONC. MS	% REC.	CONC. MSD	% REC.	RPD	QC LIMITS*		COMMENTS
								RPD	RECOVERY	
VOA SMO #	1,1-Dichloroethylene							<15%	51-151	
	Trichloroethylene							<15%	74-128	
	Chlorobenzene							<15%	67-131	
	Toluene							<15%	58-132	
	Benzene							<15%	56-132	
B/N SMO #	1,2,4-Trichlorobenzene							<50%	38-108	
	Acenaphthene							<50%	57-115	
	2,4-Dinitrotoluene							<50%	43-113	
	Di-N-Butylphthalate							<50%	13-113	
	Pyrene							<50%	25-137	
ACID SMO #	N-Nitrosodi-N-Propylamine							<40%	34-114	
	1,4-Dichlorobenzene							<40%	33-103	
	Pentachlorophenol							<40%	19-123	
	Phenol							<40%	23-81	
	2-Chlorophenol							<40%	33-107	
PEST SMO #	p-Chloro-M-Cresol							<40%	32-108	
	4-Nitrophenol							<40%	15-93	
	Lindane							<40%	87-107	
	Heptachlor							<40%	43-125	
	Aldrin							<40%	45-109	
	Dieldrin							<40%	56-122	
	Endrin							<40%	89-101	
	P,P-DDT							<40%	82-102	

RECOVERY: VOAS _____ out of _____; outside QC limits
B/N _____ out of _____; outside QC limits
ACID _____ out of _____; outside QC limits
PEST _____ out of _____; outside QC limits

*Asterisked values are outside QC limits.
RPD: VOAS _____ out of _____; outside QC limits
B/N _____ out of _____; outside QC limits
ACID _____ out of _____; outside QC limits
PEST _____ out of _____; outside QC limits

*Date Limits Set 12/82
Revision Due 6/83

CONTRACT NO. _____
HIGH LEVEL _____
OTHER (Specify) _____
UNITS (Circle) _____ ug/kg _____ ug/l

CASE NO. _____
LOW LEVEL _____
WATER _____
QC REPORT NO. _____

CONTRACTOR _____
MED. LEVEL _____
SOIL/SED. _____

CONTRACTOR
MED. LEVEL
SOIL/SED.

CASE NO. _____
LOW LEVEL _____
WATER _____
OC REPORT NO. _____

CONTRACT NO. _____
HIGH LEVEL _____
OTHER (Specify) _____
UNITS (Circle) _____ ug/kg _____ ug/l

CONTRACT

	CONCENTRATION	DETECTION LIMITS	COMMENTS
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DETECTION LIMITS

CONCENTRATION

[illegible]

**FRACTION
VOLATILES:**

File I.D.

**Instrument
1.0.**

SEMI-VOLATILES:

File 1.0.

**Instrument
I.D.**

PESTICIDES:

File I.D.

Instrument

Exhibit B
Page 24 of 42

INSTRUMENT TUNE AND PERFORMANCE SUMMARY

CASE NO. _____	CONTRACTOR _____	CONTRACT NO. _____
LOW LEVEL _____	MED. LEVEL _____	HIGH LEVEL _____
WATER _____	SOIL/SED. _____	OTHER(Specify) _____

DFTPP and BFB Performance Results:

_____ The DFTPP performance results were reviewed and found to be within the specified criteria.

_____ The BFB performance results were reviewed and found to be within the specified criteria.

<u>DFTPP</u>		<u>BFB</u>	
<u>Mass</u>	<u>Ion Abundance Criteria</u>	<u>Mass</u>	<u>Ion Abundance Criteria</u>
51	30-60 percent of mass 198	50	15-40 percent of mass 95
68	less than 2 percent of mass 69	75	30-60 percent of mass 95
70	less than 2 percent of mass 69	95	base peak, 100 percent
127	40-60 percent of mass 198	96	5-9 percent of mass 95
197	less than 1 percent of mass 198	173	less than 2 percent of mass 174
198	base peak, 100 percent	174	greater than 50 percent of mass 95
199	5-9 percent of mass 198	175	5-9 percent of mass 95
275	10-30 percent of mass 198	176	greater than 95 percent, but
365	greater than 1 percent of mass 198		less than 101 percent of 174
441	present but less mass than 443	177	5-9 percent of mass 176
442	greater than 40 percent of mass 198		
443	17-23 percent of mass 442		

Deviations:

<u>Date/Time</u>	<u>Instrument</u>	<u>File #</u>	<u>Compound</u>	<u>m/z</u>	<u>Required Abundance</u>	<u>Observed Abundance</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

FSCC AUDIT SUMMARY:

50 ng benzidine detectable for all runs? _____

Pentachlorophenol response factor >.05 relative to D-10 anthracene for all runs? _____

Comments:

VIII. CHROMATOGRAPHY CHECKS

Type of Column: Packed Column _____ Fused Silica Capillary Column (FSCC) _____

Packed Column Chromatography Check

<u>Tailing Factors</u>	<u>Acceptance Windows</u>	<u>Actual</u>
Benzidine	Less than 3	_____
Pentachlorophenol	Less than 5	_____

FSCC Chromatography Check

50-ng benzidine detectable? Yes _____ No _____
Pentachlorophenol response factor? Yes _____ No _____

Remarks: _____

IX. STANDARDS

General shape of the total ion chromatogram:

	<u>Acids</u>	<u>Base/ Neutrals</u>	<u>Volatiles</u>	<u>Pesticides</u>
Peak Shape	_____	_____	_____	_____
Interferences	_____	_____	_____	_____
Background	_____	_____	_____	_____

Area Response

4-nitrophenol	_____
2,4-dinitrophenol	_____
Pentachlorophenol	_____
Benzidine	_____
Hexachlorocyclopentadiene	_____
Nitrobenzene	_____
Isophorone	_____
Dinitrotoluenes	_____

Remarks: _____

Reviewer's Name: _____

FIS Telephone No.: _____

Commercial Telephone No.: _____

X. CALIBRATION VERIFICATION - OPTIONAL

(Improper calibration should be reported under Comments Section on the Introduction Page.)

Calibration verified at least once each 8-hour shift: Yes _____ No _____

Mean percent change less than 20% for:

Base/Neutral Fractions:	% Change
Acenaphthene	_____
1,4-dichlorobenzene	_____
Hexachlorobutadiene	_____
2-chloronaphthalene	_____
N-nitrosodiphenylamine	_____
Di-n-octylphthalate	_____
Fluoranthene	_____
Benzo(a)pyrene	_____
Mean	_____

Date of: Calibration _____
Verification _____
Analysis _____

Acid Fractions:

P-chloro-a-cresol
2,4-dichlorophenol
2-nitrophenol
Phenol
Pentachlorophenol

Mean

Date of: Calibration _____
Verification _____
Analysis _____

Volatile Fractions:

1,1-dichloroethylene
Chloroform
1,2-dichloropropane
Toluene
Ethylbenzene

Mean

Date of: Calibration _____
Verification _____
Analysis _____

Instrument found to be in calibration during analysis: Yes _____ No _____

Remarks: _____

**SPECIAL ANALYTICAL SERVICES
REVIEW DOCUMENT**

A. Client _____

B. Laboratory(s) _____

C. SAS Number _____

		Task Code(s)
D. Specific Request:	Organics _____	_____
	Inorganics _____	_____
	Other _____	_____

		Protocol Code(s)
E. Analytical Methodologies:	Organics _____	_____
	Inorganics _____	_____
	Other _____	_____

F. Methods Source _____

G. Reviewer Name _____

H. Reviewer Function or Title _____

The purpose of this inquiry is to gain information and recommendations from the SAS Program Principals directly, in order to improve the methodology(ies), QA/QC requirements, or reporting formats for future similar Special Analytical Services. Therefore, please respond in a timely fashion to all questions and requests.

**SPECIAL ANALYTICAL SERVICES
CLIENT REVIEW INQUIRY**

Please return this inquiry document to SMO after review of the data package for this Special Analytical Service.

A. General Methodologies

1. Did the referenced methodology(ies) or protocol provide technically useful information for this specific SAS request? If not, please explain.

2. Describe any changes in methodology or other technical improvements that you recommend in order to more adequately perform this specific SAS task.

B. QC Requirements

1. Were the QC procedures adequate for determining the quality of the data for this specific SAS request? If not, describe any problems encountered with the QC information.

2. Describe any changes in the QC requirements that you recommend in order to more adequately perform this specific SAS task.

C. Data Sheets and Report Format

- 1. Were the reporting deliverables clear and understandable? If not, please explain.**

[illegible]

- 2. What changes in report or deliverable format do you recommend?**

D. Other Comments

Enter here any comments or recommendations for items not covered above.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or printed text on the paper.